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ABSTRACT

This paper proposes a framework for the application of psychology to schooling that engages collaboration among users and has the potential to improve education outcomes. The assumption underlying this approach is that effective application to social and schooling contexts are self-directed, active, and experiential. The Learner-Centered Psychological Principles were established to help connect the scientific contributions of psychology as a framework of school restructuring that reflects conventional and scientific wisdom. The principles are organized into four categories: (1) cognitive; (2) motivational and affective; (3) development and social; and (4) individual difference factors. These principles were written to stress individual process and conditions that are central to learning. Psychology can help set the agenda in educational reform, particularly by continuing to document exemplary practices in application of psychology in promoting a learner-centered perspective. (JDM)

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Applications of Psychological Knowledge to Schooling*

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We psychologists assert that our science promotes the well-being of the population, informs the teaching and learning process, is fundamental to the preparation of professionals in community service settings, and that it is essential in the design of interventions to promote development and psychological well being. The wealth of knowledge we have produced causes the public to challenge us to make our findings more useful and practical. But if psychological science is to become a more active force in the public school teaching-learning process or in our communities, should the burden of translation of knowledge to practice be on the scientist or professional/recipient of the knowledge, or both? Is expecting scientists to develop the applications the most realistic and effective strategy? I hope to propose a framework for psychology's applications to schooling that shows that collaborating with users has the biggest payoff for improvement of educational outcomes The assumptions underlying this approach are that effective applications to social and schooling contexts are self-directed, active, and experiential. They promote conceptual development and ensure the continued applications of psychological principles over time.

Psychology as a stakeholder in reforming schooling.

Psychologists and psychological principles in the reform policy debates.

Proposals for reform of education over the past two decades, beginning with the publication of a Nation At Risk: The Imperative for educational Reform in 1983 and

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culminating with the 1994 publication of GOALS 2000: Educate America Act, focused attention on new designs for our nation's schools. When the White House asked APA if they would like to have a role in educational reform, the Board of Directors established the APA Presidential Task Force on Psychology in Education early in the 90s. The goals of the Task Force were to focus attention on the contributions of American Psychology to understanding the learner in educational contexts, and to examine ways that such a focus highlighted psychology's century long contributions to understanding learners and the learning process. Challenged by several school superintendents and other educational leaders, the first objective to be faced was that psychology had to develop a simple and easily understood set of statements about how psychology could inform the educational reform debate.

The Task Force decided on a focus on the learner, rather than on teaching and pedagogy, curriculum and instruction, or on the administrative structure of the school. Our psychological scientific contributions could then be focused, distinctive, and explicit. The expectation was that centering attention on the learners, the contexts of their schooling, and measurable gains in learner development and achievement would sustain a place for psychology in the educational reform debates.

Centering on the learner was a bottom-up approach to reform contrasted with reform proposals in the 80s which were top-down directives attributing poor school achievement to low academic standards and poor quality of instruction. Solutions were to be driven by state government actions that raised standards, and in turn, were assumed to raise achievement levels. It followed that the classroom teacher was to be held accountable for improving educational outcomes.

Later, in the 90s many argued that increasing state-mandated educational standards and prescribing the content and form of schooling were too rigid, passive, and rote-oriented to produce the thinkers needed to be workers in the 21st century. To be truly effective, this

new movement argued that change initiatives must take into account specific local needs at the local level (Conley, 1991) and the participation of those involved in the process. The 90s view of reform focused on system restructuring to achieve a comprehensive approach to change. This was a more receptive environment in which psychology could achieve its goal to participate in reform.

Restructuring has many definitions. One is the emphasis on challenging fundamental assumptions about student learning, where learning is defined as the ability to retain, synthesize, and apply conceptually complex information in meaningful ways. Another is that restructuring involves changes in roles, rules, and relationships between and among students and teachers, teachers and administrators, and administrators at various levels from the school building to the district office to the state level, all with the aim of improving student outcomes. In this context the Psychology and Education Task Force was favorably placed to highlight the learner as central to any restructuring efforts and systemic change.

A strategic role for Psychology in educational reform.

Our objectives were clear - how could we cast the century-long scientific contributions of psychology as a framework for school restructuring that reflected our conventional and scientific wisdom. The Learner-Centered Psychological Principles was the result. A book based on two conferences, an APA mini-convention, and symposia at subsequent national conferences (Lambert & McCombs, 1999) How Students Learn: Reforming Schools Through Learner-Centered Education, provided the research base for the principles and examples of how the principles were being reflected in classroom teaching, the design of assessment systems, teacher-education programs, and learner-centered classrooms, and their impact on policy.

The 14 Principles are organized into four categories of factors that influence learners and learning: Cognitive , motivational and affective , developmental and social , and individual difference factors. And the Principles are intended to apply to all learners - from

children to teachers, to administrators, to parents, and to community members involved in the educational system. The publication of the Principles identified the learner-centered approach as a distinctive contribution for psychology in reforming America's schools. Basing educational reform decisions on foundational psychological knowledge about learners and learning recognizes that to the degree that instructional processes are consistent with this knowledge base, the educational system is more responsive to learner needs and learning potential and that a learner-centered system, in turn, ensures the promise of enhanced learning outcomes for every learner.

The Principles were written to stress the within-individual processes and conditions that are central to learning. In other words, how learners respond in the classroom. But it must be noted that the learner always works in a social context. In this sense the Principles describe what is going on with learners in school contexts. Applications of psychological science are contextual as well. It is common for scientists to eschew requests to show how their research programs might have applicability beyond the settings and participants that were elements in their research. But when scientists believe their work has potential to influence practice, the basis for research to practice collaboration is established. This seems a fairly simply challenge; however, the hurdles to accomplish it successfully remain.

We know that such initiatives require changes in ways psychologists, both academic and professional, interact with current and future education professionals. Many psychologists are already engaged in such innovative exchanges. New theories of instruction and learning (Brown and Campione's 1998) show how classrooms can be constructed as communities of learners where every child is a participant at a level of accomplishment consistent with his or her own development. . In this new theory, the learner is encouraged to actively speculate, to develop metacognitive awareness of what is being learned and how the learner feels about that new learning. And though every learner is actively involved in the classroom learning community, the importance of individual

differences and predispositions to learn some things more readily than others remain. . Even with the success of this approach in improving learning outcomes, the results of the research from these "real world" laboratories cannot "taught" to other teachers; teachers have to design their own applications of them. In other words successful classroom utilization of psychological research has to become "teacher-centered," a collaborative venture with the psychological scientists and teachers sharing knowledge from their respective disciplines to promote learner development. Just as we know that top-down teacher instruction does not succeed for all learners, top-down teaching teachers how to use research findings will not work either.

Assessment in learner-centered contexts.

In any restructuring effort, one must consider ways to assess learning outcomes. Our society expects that students leaving K-12 schools will be prepared to work, or prepared for higher education. Ultimately questions about whether we should assess individual outcomes, or the products of courses, or the success of the system, are policy questions. But when we expect an elementary school graduate to be prepared for high school courses, or a high school graduate to be prepared for work or prepared for freshman college classes, we are focusing on the learner, not the course nor the system.

Policy makers focus on outputs, and in turn decide what students are to know and what they are able to do. But the challenge for learner-centered schools is to design methods of assessing the outputs that consider ways of measuring individual student progress over time, making informed normative comparisons of assessments with standards, considering the practice implications of assessments, and the ways that the assessments influence future behavior and the outcomes for each learner.

From Principles to applications

As professors and professionals committed to making a difference in schools, what are our starting points for learner-centered and teacher-centered systems? How can we affect the individuals who will guide the course of educational reform in the future? Of,

course, our graduate students are one critical group, those who will largely chart the course of scientific applications of the work that is currently underway. But two other pivotal groups are teacher education students and professional educators who request us to assist them to rethink their educational programs.

In "Talks to Teachers", William James (1892) acknowledged that psychology did not provide prescriptives for instructional methods, nor models that translated psychological knowledge to detailed procedures that would work for all children in all situations. At the same time in Witmer's Psychological Clinic at the University of Pennsylvania, the psychological laboratory that was to become an institute for social and public service, for original research, the goals were to identify aspects of psychology that could explain everyday problems confronted in schooling and solutions and applications would be developed by the students and their professors. Nearby at Teachers College E. L. Thorndike (1903), the first "educational psychologist" did not believe in a simple general theory of educational psychology, but proposed that each bit of knowledge, each interest, each habit, each power, each ideal, had it own best means of attainment. From these early developments until today, teacher education programs require students to learn an array of psychological theories, take tests or write papers about them, and expect that applications to professional practice and the teaching and learning process will follow.

A Teacher-Centered Orientation in Teacher Education Programs.

A botany colleague once told me that professors make the mistake of expecting that they should know everything that the field offers or needs to discover, but that the really successful professor shares the problem solving process with students and learns with them. Of necessity, we can acquire only limited sets of knowledge. But we hope to be able to answer student questions in class, or questions from the public in our area of expertise. Recognizing the limits of possible applications of our research, we balk at requests to explain how what we know applies to particular real-world problems in schools or communities. "I know about early cognitive development, but know nothing about

teaching or schools", for example. But teachers know a lot about teaching and schools, and little about early cognitive development. A place to begin in the collaborative "science to practice" process is by asking the student, teacher, or education professional to describe the problems and issues they are encountering. One doesn't start with expecting to have answers - just good observations.

The Developmental Teacher Education Program (Ammon and Black, 1998) was designed to encourage teachers to become knowledgeable agents using developmental theory in designing learner-centered classrooms. The program involves teachers acquiring knowledge of developmental theories, bringing examples from their classroom placements showing how each theory might explain the nature of a learner a learner's problem in an instructional or social context, and considering ways to modify instruction to engage pupils in activities that will further their development. The faculty provide the theoretical context, the teachers describe the settings and the children's behavior where the theory might apply, and together they extend the theories in new directions, both theoretically and practically. As each teacher creates his or her own strategies for utilizing a developmental perspective with learners, the classrooms are teacher-centered as well.

Inevitably, when a teacher education student comes forward with a question about the relevance of early cognitive development for reading acquisition or mathematics concepts, one strategy for the academic or professional psychologist is to stand back and say "I don't know", but let's explore the problem. As the exploration proceeds, the two interact to find commonalties between knowledge and problems. This way the professor learns about the developmental issues the teacher faces and can ask questions clarifying possible developmental implications. The future teacher, in turn, identifies the specific aspects of the problem with developmental implications, and with supportive interactions from the professor gains confidence in thinking and writing about areas where little heretofore may have been written.

Promoting the application of psychological research in professional development (continuing education) programs for educators.

Professional staff development requested by school systems is one of the key mechanisms psychologists use to inform education professionals about new scientific findings with practice innovations that might be incorporated in their teaching. Translating research findings from the laboratory to practice in the classroom seems an obvious way to inform the professional about scientific developments, to show them how it was done in the laboratory, and then to expect them to incorporate it into practice, like a new mathematics curriculum, programs on social skills training, improving intrinsic motivation, or more learner-centered classroom management strategies. Typically, the psychologist presenter provides the knowledge, institutes an effort to determine whether the knowledge has gotten across, and asks for feedback about unanswered issues. Such efforts often are viewed positively by professional educators. They learned something new, extended previous concepts, or seen new methods. But when the program ends, the professional later may be discovered not to be using this knowledge or integrating it into practice applications - the knowledge and principles are correct, but the diversity of the problems encountered discourage application, and the professional may believe that the fault lies with them since the knowledge seemed to be so clear and straightforward when it was presented.

Swift and Healey (1986) make an exceptionally clear analysis of these issues. In disseminating intervention programs expected to have high value in promoting social and psychological well-being, they defined the research framework for the intervention, identified the constituencies which needed to become part of the preventive intervention program, and developed a working model for communication among the participants. Then they moved into the community to demonstrate their interventions, and to showcase their promise in real-world settings. Successful in one intervention setting, they extended the programs to other settings. But as they were moving out of one setting to another, and

gathering up their materials for the new site, the community professionals were beginning to return to their old way of doing things. Rather than stimulating new practice, they concluded that they were just conducting another research study in a different setting. While they had demonstrated the importance of the prevention intervention research agenda, the professionals had seen no need to apply them. The interventions were viewed as separate from the systems into which they had been introduced. It became obvious that they had not addressed what was important to the participants, nor how the intervention would contribute to the participant's goals. They concluded that sustaining a program bore less of a relationship to the qualifications of the staff or the quality of the methods, than to involving the personnel in the design of the intervention that they ultimately were expected to incorporate into practice.

An exemplary program in Northern California, the Early Success in School Program (Swain & Cox, 1976), was specifically designed to revise classroom curricula with classroom activities that allowed five and six year old children to improve critical thinking skills and to develop a more positive attitude toward themselves and their school work. The underlying goal was to encourage teachers to provide young children with experiences that promoted the child's development while at the same time insuring successful acquisition of academic skills in reading, mathematics, and language. An important, allied objective was to inform teachers about the importance of developmental processes in the acquisition of critical thinking skills in five and six year olds. The psychologists presented the developmental concepts and possible relevant classroom approaches and teachers explored their use. The program began with a 3 day introductory workshop to introduce the concepts of development of critical thinking and self concepts. The teachers were to consider this knowledge as they identified classroom strategies for enhancing positive self concept development and promoting thinking skills. Even at the beginning of the program the teachers were expected to become actively involved in designing their own activities to

acquisition of critical thinking skills in five and six year olds. The psychologists presented the developmental concepts and possible relevant classroom approaches and teachers explored their use. The program began with a 3 day introductory workshop to introduce the concepts of development of critical thinking and self concepts. The teachers were to consider this knowledge as they identified classroom strategies for enhancing positive self concept development and promoting thinking skills. Even at the beginning of the program the teachers were expected to become actively involved in designing their own activities to further the goals of the program. If children benefited from these activities, it was expected that growth in the achievement areas would follow.

The initial introductory workshops were followed by workshops throughout program implementation during which more information about improving memory strategies and thinking skills was provided and teachers reflected on ways that these could be promoted in the classroom. Relevant child development research on cognitive and concept development was reviewed, and the research on self concept development and activities to promote positive self concepts were presented with teachers offering examples from their efforts in the classroom. But it was not only the teachers who developed new ways of incorporating activities that promoted critical thinking skills and self concepts, the pupils in every project classroom had more well developed thinking skills than pupils in the comparison classes. Kindergartners had higher pre-reading and math scores, and first graders had higher math and language scores than comparison classes. Throughout this program teachers identified and shared their classroom activities, and the psychologist presenter modified concepts and identified additional knowledge that would enhance understanding of the individual differences among the pupils' involvement in training. Student performance on the planned program evaluation showed that more project than comparison children were able to employ a wider variety of strategies at the end of the year.

Initially these were psychologist and teacher programs. But as the year evolved, the teachers "owned" the outcomes of these programs by preparing, designing, and testing the

applications. Then they could prepare summary reports making recommendations for future efforts. This program differs from most other staff development activities. The psychologists were an integral part of the year's staff development program, and all participants - psychologist, teachers, and pupils - were expected to gain as a result of the experience.

The engagement of the "learner" or the "professional" is a crucial aspect of process of developing and implementing activities that apply psychological knowledge in practice. In these examples of the Developmental Teacher Education Program, or the program to promote classroom activities for critical thinking, psychologists taught psychology, not psychology applications. Students and professionals used this knowledge to construct solutions, developed new ways of thinking about psychology in practice, and merged this new knowledge to personal theories by tryouts and feedback of applications as they are tried.

Psychology's Agenda in Educational Reform

"Learner-Centered" is now in the reform lexicon. The Principles, How Students Learn, and national and regional discussions are taking place. But psychologists must continue to talk with the future users of psychological science, not among themselves. How can we continue to promote our strategic role in reform?

- With the advent of a new administration in Washington, regardless of the outcome of the November election, now is the time to advocate psychology as an active player with specific roles in representing learners in educational reform. We need a set of policy initiatives that will encourage continuation of these achievements.

- APA should be actively engaged on a continuous basis in promoting an educational reform agenda with a learner-centered perspective. A first step could be a series of small regional conferences or working groups networking within a "national conference" framework showcasing examples of ways that a learner-centered perspective has reformed the educational enterprise and promoted higher levels of student achievement and

development. These easily could be formatted s continuing education programs offered in many different venues.

• We can continue to document exemplary practices in applications of psychology in promoting a learner-centered perspective in graduate student programs, in teacher education programs, in programs for future administrators, and for parents and the public

• APA's policy and advocacy arms can be strengthened to represent the contributions of psychology to education in the development of new approaches to assessing academic and social growth of students with learner-centered perspectives, in the preparation of education professionals. An effort parallel to the one that promotes the contributions of professional psychology to the Nation's mental health should be in place to promote the contributions of scientific psychology to schooling and to the well-being of our children's youth and their teachers.

• Learner-centered schooling and professional -centered applications of psychology require the psychological scientist, or the professional psychologist, to begin to build the bridge over the gap between science and practice. Collaborative problem solving works, and the more we take risks to try them, the more we will know about how to make them work better.

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